

TITLE

TITANIUM DIOXIDE NANOPOWDER MANUFACTURING PROCESS

ABSTRACT

Titanium dioxide nanopowder is produced by a process, comprising:

5 (a) reacting titanium tetrachloride and an oxygen containing gas in the vapor phase in a flame reactor, at a flame temperature of at least about 800°C, a pressure ranging from about -35 to about 172 kPa (about -5 to about 25 psig) in the presence of (i) water vapor in an amount ranging from about 1000 to about 50,000 parts per million, based on the weight of titanium dioxide under

10 production, (ii) a diluent gas in an amount greater than about 100 mole percent based on the titanium tetrachloride and oxygen containing gas and (iii) a nucleant consisting essentially of a cesium substance wherein the cesium substance is present in an amount ranging from about 10 to about 5000 parts per million, based on the weight of the titanium dioxide under production, to form titanium dioxide

15 nanopowder, and recovering the titanium dioxide nanopowder having a surface area in the range of about 30 to about 300 m<sup>2</sup>/g and wherein about 50 volume percent of the particles have a diameter of about 80 nm or less and wherein about 90 volume percent of the particles have a diameter of about 100 nm or less.

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